

**REMARKS/ARGUMENT****Regarding the Claims in General:**

Claims 1, 3, 4, 6-19, and 23-52 are now pending. Claims 1, 16, and 17 have been amended, and claim 21 has been replaced by claim 52 to better highlight the distinguishing features of the invention, and to improve the form thereof, claims 1, 3, 4, 7, 10, 23, 24, 29, 34, 35, 37, and 43 have been amended to improve the form thereof, and claims 23-29 and 38 have been amended to depend on substituted claim 52. Claim 37 has been broadened slightly, and claim 38 has been amended to highlight a distinguishing feature of the invention.

The features of claim 2 have been incorporated into claim 1, and claim 2 has been canceled without prejudice.

New claim 51 has been added to provide applicants with additional protection to which they appear entitled in view of the prior art.

**Regarding The Allowable Subject Matter**

Applicants note with appreciation the indication that claims 12-20, 33-36, 40-42, 44, and 47-50 would be allowed if rewritten in independent form incorporating the limitations of their respective parent claims. Because these claims are all directly or indirectly dependent on claims 1, 52 and 27, which are believed to be allowable as amended, the above-noted claims have been retained in dependent form pending the Examiner's further consideration.

Further in connection with allowable claims 16 and 17, a possible ambiguity in these claims was noted during preparation of this response. To avoid this, claim 16 has been amended, and claims 17 and 20 have been combined. Claim 20 has accordingly been canceled.

**Regarding the Prior Art Rejections:**

In the outstanding Office Action, claims 1-6, 21-26, 37-39, and 43 have been rejected as being anticipated by Lauener U.S. Patent 4,773,468 (Lauener) and claims 7-11, 27-32, 45, and 46 have been rejected as being unpatentable over Lauener and further in view of Hartz U.S. Patent 5,823,936 (Hartz).

Claim 1 is directed to a casting roll for continuous casting of thin metallic strips which comprises:

a roll core having an outer lateral surface:

an annular roll shell which surrounds the roll core and includes an inner lateral surface opposite the outer lateral surface of the core, wherein:

the roll shell is shrunk onto the roll core so that the outer surface of the roll core and the inner surface of the roll shell are in contact substantially over their entire surfaces;

at least one of the lateral surfaces has elevations and depressions forming a surface structure thereon having a roughness ( $R_z$ ) on the surface of between about 2  $\mu\text{m}$  and about 1500  $\mu\text{m}$ ; and

at least some of the elevations and depressions are oriented in the direction of a rotational axis of the casting-roll.

The construction recited in claim 1 is definitely not anticipated by Lauener. Fig. 1 of the reference illustrates a conventional construction with a roll core 3, a shell 1, and longitudinal grooves 2 for flow of coolant. The illustrated structure does not meet the requirements that the roll shell be shrunk onto the roll core so that the outer surface of the roll core and the inner surface of the roll shell are in contact substantially over the respective entire surfaces, and for elevations and depressions on at least one of the lateral surfaces which form a surface structure thereon having a roughness ( $R_z$ ) on the surface of between about 2  $\mu\text{m}$  and about 1500  $\mu\text{m}$ .

For one thing, Lauener's grooves can not, in any reasonable sense, be regarded as a surface roughness. Fig. 1 illustrates nothing more than a smooth surface with semicircular grooves which occupy at least half of the surface area. Moreover, even though the shell is shrink fitted onto the core, the outer surface of the roll core and the inner surface of the roll shell are not in contact substantially over the respective entire surfaces, since at least the portions of the core surface forming the inner surfaces grooves are not in contact with the inner surface of the shell.

Finally, there is nothing in Lauener from which the dimensions of grooves 2 can be inferred, so, even apart from the issue of surface roughness, it clearly can not be said that grooves 2 have a radial extent ranging from between about 2  $\mu\text{m}$  and about 1500  $\mu\text{m}$ .

The construction which is actually the subject of Lauener is even more remote. Here, rods (4, 4', 4'') are placed between the roll core and the shell, and the shell is shrink fitted to the rods. The result is a construction with a clearly defined free space between the surfaces of the core and the shell, which are not in contact at any point on their respective surfaces.

Nor does Hartz remedy the deficiencies in Lauener discussed above. The Hartz device is entirely conventional except in the use of overlays of stainless steel of different hardness. Hartz neither discloses, teaches, nor suggests anything about a shrink fitted connection between two roll surfaces in which the outer surface of the roll core and the inner surface of the roll shell are in contact substantially over the respective entire surfaces, and in which one of the surfaces has a surface roughness of between about 2  $\mu\text{m}$  and about 1500  $\mu\text{m}$ .

Accordingly, for the reasons stated, independent claim 1 and its dependent claims 3, 4, 6-11, and 46 should be allowed.

Claim 52, which has replaced claim 21, should also be allowed. This claim is directed to a process for producing a casting roll of the kind recited in claim 1. The method comprises the steps of:

preparing at least one of the adjacent surfaces by forming radially extending elevations or depressions thereon, at least some of which are oriented in the direction of the casting-roll axis, to define a surface structure characterized by a roughness ( $R_z$ ) of between about 2  $\mu\text{m}$  and about 1500  $\mu\text{m}$ ,

then drawing the roll shell onto the roll core so that the outer and inner lateral surfaces oppose each other, while holding the roll shell at a temperature which is higher than the temperature of the roll core.

As explained above, neither the prior art shown in Fig. 1 of Lauener, nor the patented construction shown in Figs. 2-5, discloses, teaches or suggests elevations and depressions on at least one of the lateral surfaces which form a surface structure thereon having a roughness ( $R_z$ ) on the surface of between about 2  $\mu\text{m}$  and about 1500  $\mu\text{m}$ . And likewise, as explained above, nothing in

Hartz remedies this deficiency in Lauener. Claim 52, and its dependent claims 23-36, and 38-42 should therefore be allowed, along with claim 1, and the claims dependent thereon.

Finally, claim 37, and its dependent claims 43 and 44 should also be allowed. Although claim 37 does quantitatively specify the surface roughness, the claim does require:

fitting securing bars into the grooves wherein the grooves and the bars therein are so sized and shaped that the bars project above the outer lateral surface of the roll core in the radial direction,

then drawing the roll shell onto the roll core while holding the roll shell at a temperature which is higher than that of the roll core for producing a shrink-fit connection between the securing bars and the roll shell such that the securing bars are pressed into the inner lateral surface of the roll shell, and

producing at least one sealed join between the roll core and the roll shell.

Neither Lauener nor Hartz alone, or together, discloses, teaches or suggests pressing securing bars into the opposed lateral surface, or providing a join between the roll core and the shell. These claims should also be allowed for this reason, as well.

In view of the foregoing, favorable reconsideration and allowance of this application are respectfully solicited.

I hereby certify that this correspondence is being transmitted by Facsimile to (571) 273-8300 addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

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Respectfully submitted,

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